EXHIBIT 1

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF NEW YORK

CARNEGIE INSTITUTION OF WASHINGTON and M7D CORPORATION, *Plaintiffs,* v. FENIX DIAMONDS LLC, *Defendant.*	Civil Action No. 1:20-cv-0200 (JSR) Honorable Jed S. Rakoff
FENIX DIAMONDS LLC, *Counterclaim-Plaintiff,* v. CARNEGIE INSTITUTION OF WASHINGTON and M7D CORPORATION, *Counterclaim-Defendants.*	

FENIX'S FIRST SUPPLEMENTED PRELIMINARY INVALIDITY CONTENTIONS UNDER LOCAL PATENT RULE 7

Pursuant to Local Patent Rule 7, Defendant Fenix Diamonds LLC ("Fenix") hereby serves its First Supplemented Preliminary Invalidity Contentions ("Contentions") concerning asserted claims 1, 6, 7, 11, 12 and 16 of the U.S. Patent No. 6,858,078 ("the '078 patent") and claims 1 and 2 of U.S. Patent No. RE41,189 ("the '189 patent") (collectively, the "Asserted Claims").

In these Contentions, with respect to each of the Asserted Claims, Fenix: (i) identifies each currently known item of prior art that anticipates or renders obvious each Asserted Claim; (ii) submits charts for illustrative prior art references identifying where each limitation of each Asserted Claim is disclosed or rendered obvious by the prior art; (iii) identifies the grounds for invalidating Asserted Claims under 35 U.S.C. § 101 for failure to claim patent eligible subject matter; and (iv) identifies the grounds for invalidating Asserted Claims based on indefiniteness, enablement, and/or written description under 35 U.S.C. § 112.

The prior art referenced in these Contentions is produced herewith or has been previously produced in connection with Fenix's March 20, 2020 Local Patent Rule 7 Disclosure. The present Contentions incorporate Fenix's March 20, 2020 Local Patent Rule 7 Disclosure by reference herein. Each allegation of invalidity set out in Fenix's Answer to the Amended Complaint, Dkt. 43, is incorporated by reference herein.

Defendants PGD's and IIa's Local Patent Rule 7 Disclosure (both preliminary (served on March 20, 2020 to the best of Fenix's knowledge) and supplemented (to be served on May 26, 2020 to the best of Fenix's knowledge), are incorporated by reference herein. Fenix reserves the right to rely on any invalidity position, including any reference, set forth by Defendants PGD and IIa in their Local Patent Rule 7 Disclosures.

Exhibit C.1

to

Fenix's First Supp. Prelim. Invalidity Contentions Under Local Patent Rule 7

’189 Claims	Anthony 482 (EP 0 671 482)
1.[pre] A method to improve the optical clarity of CVD diamond	“The present invention relates to a process for enhancing the properties of low pressure chemical vapor deposited (CVD) diamond and the enhanced product resulting from such treatment.” Anthony 482 at 2:3–5. “A high purity CVD diamond structure… enhances optical transmission.” Anthony 482 at 2:51–52. “The resulting diamond is characterized by a reduction in the size of the voids.” Anthony 482 at 7:5–6.
1.[A] where the CVD diamond is single crystal CVD diamond,	“Annealing may be utilized… [with] an imperfect single- or poly-crystalline body.” Anthony 482 at 2:16–17. “Diamond films are prepared… using microwave plasma.” Anthony 482 at 2:36–37. “The present invention also contemplates improving the properties of other types of diamond parts, including single [crystal] diamond.” Anthony 482 at 7:22–23.
1.[B] by raising the CVD diamond to a set temperature of at least 1500° C. and a pressure of at least 4.0 GPA outside of the diamond stable phase.	“The conditions of annealing are dependent on the type of defect… that is to be removed from the diamond body. Density fluctuations caused by cracks or voids can be removed by milder conditions leading to plastic flow.” Anthony 482 at 6:43–45. “Starting CVD diamond... [is] annealed by heat treatment... such that the diamond is placed in an environment where it is thermodynamically stable phase of carbon. Typically this includes temperatures in the range of 1000–2000°C and pressures from 1 GPa up to 20GPa, preferably in the range of 5–7Gpa and temperatures in the range of 1400–1700°C.” Anthony 482 at 6:38–42; see further, Anthony 482 at FIG. 1 (point at pressure of about 53kb and 1600 C); Anthony 482 at claim 5. “If the diamond is placed in a high–pressure press at 50kbar, the temperature can be raised routinely in the range of 1000–1600°C without leaving the diamond stable region.” Anthony 482 at 4:39–41. “To remain in the diamond stable region at [temperatures above 1100°C] the diamond must be at pressures greater than 50kbars... Therefore, the diamond will plastically yield by slip around the cavity and the cavity will collapse.” Anthony 482 at 6:16–20. “Starting CVD diamond... [is] annealed by heat treatment... such that the diamond is placed in an environment where it is thermodynamically stable phase of carbon. Typically this includes temperatures in the range of 1000–2000°C and pressures from 1 GPa up to 20GPa, preferably in the range of 5–7Gpa

	and temperatures in the range of 1400–1700°C." Anthony 482 at 38–42; see further, Anthony 482 at FIG. 1. "In accordance with the present invention, the resulting CVD having reduced density gradients is densified at temperatures and pressures where diamond is the thermodynamic stable phase of carbon." Anthony 482 at 7:4–5.
2. The method of claim 1 wherein the CVD diamond is a single crystal coating upon another material.	"According to the processes set forth in the patent, diamond is grown by chemical vapor deposition on a substrate." Anthony 482 at 3:27–28. "*When* used as free–standing films, thicknesses greater than 200 microns are preferred." Anthony 482 at 3:38–39. Emphasis added. "As an alternative to the method described above, it may be desirable to... finish the diamond parts and then subsequently press. As an alternative to the method described above, annealing of three dimensional parts such as tubes, nozzles, beads, bearings, hemispheres, or other unusually shaped components may take place... The present invention contemplates any sequence of events." Anthony 482 at 15–19. "The present invention also contemplates improving the properties of other types of diamond parts, including single [crystal] diamond, specifically including diamond wire dies, tools and wear parts including friction–reducing diamond surfaces, diamond windows, heat sinks, diamond electronic components." Anthony 482 at 7:22–24. "A preferred starting CVD diamond for optical applications typically has crystals with a <110> orientation perpendicular to the bottom surface." "When preferred starting CVD diamond films are produced by deposition on substrates." Anthony 482 at 7:53. "An as–grown CVD wafer... was broken in half... one piece was... annealed... The pressure across the wafer surface will be distributed uniformly." Anthony 482 at 8:15–16.

’189 Claims	Anthony 430 (US 5,451,430)
1.[pre] A method to improve the optical clarity of CVD diamond	“The present invention relates to a process for enhancing the properties of… chemical vapor deposited (CVD) diamond and the enhanced product resulting from such treatment.” Anthony at 1:6–9. “Increasing demands are being put on as–grown CVD diamond. For instance, windows must have the highest possible transmission of light.” Anthony at 1:22–24. “After the anneal, the absence of stresses greatly reduced the birefringence in the CVD diamond and the sample looks uniform in polarized light.” Anthony at 4:56–59.
1.[A] where the CVD diamond is single crystal CVD diamond,	“Thermal annealing may be utilized for reducing density fluctuations within an imperfect single [crystal] body.” Anthony at 1:50–52. “The crystal size of the starting CVD diamond may vary greatly… single crystals of CVD diamond may be grown.” Anthony at 3:7–11.
1.[B] by raising the CVD diamond to a set temperature of at least 1500° C. and a pressure of at least 4.0 GPA outside of the diamond stable phase.	“The inert gas pressure is preferably in the range of 1 torr to several atmospheres… To prevent graphitization at 1800°C., the annealing time must be less than 6 minutes…. Preferably, the temperature is greater than 1600 [°C].” Anthony at 4:5–18. See further Anthony at claim 1 (similar). “Placing the CVD diamond... in a high pressure/high temperature cell and exposing it to temperatures in the range of 1100 to 17700 [likely intended to mean “1700”] °C and pressures of 45 to 70 kilobars.” Anthony at 2:2–4.
2. The method of claim 1 wherein the CVD diamond is a single crystal coating upon another material.	“According to the processes set forth in the patent, diamond is grown by chemical vapor deposition on a substrate.” Anthony at 2:40–42. “The present invention also contemplates improving the properties of other diamond parts, including single [crystal] diamond, specifically including diamond wire dies, tools and wear parts..., diamond windows, heat sinks, diamond electronic components.” Anthony at 5:51–56. “When used as free–standing films.” Anthony at 2:51–52. “It may be desirable to… finish the diamond parts and then subsequently anneal.” Anthony at 5:34–37.

’189 Claims	Anthony 395 (US 5,672,395)
1.[pre] A method to improve the optical clarity of CVD diamond	"In accordance with the present invention, there is provided a process for treating CVD diamond… said processing comprising anneal." Anthony 395 at 2:13–15.
1.[A] where the CVD diamond is single crystal CVD diamond,	"The present invention also contemplates improving the properties of other types of diamond parts, including single [crystal] diamond." Anthony 395 at 7:52–54.
1.[B] by raising the CVD diamond to a set temperature of at least 1500° C. and a pressure of at least 4.0 GPA outside of the diamond stable phase.	“Said process comprising annealing said CVD diamond... so as to prevent graphitization of said diamond and at a pressure less than the diamond–graphite equilibrium pressure but above a pressure sufficient to reduce the size of the voids.” Anthony 395 at 2:14–22. “Stresses can be relieved by placing the CVD diamond in a hydrostatic environment... and exposing it to temperatures in the range of 1100 to 2300°C. and pressures of 45 to 100 kilobars.” Anthony 395 at 2:1–5. “it is desirable to be in a plastic yielding region which is below the DIAMOND-GRAPHITE line and above the plastic yield limit line.” Anthony 395 at 6:15–17.
2. The method of claim 1 wherein the CVD diamond is a single crystal coating upon another material.	“According to the processes set forth in the patent, diamond is grown by chemical vapor deposition on a substrate.” Anthony 395 at 2:45–47. “The present invention also contemplates improving the properties of other diamond parts, including single [crystal] diamond, specifically including diamond wire dies, tools and wear parts..., diamond windows, heat sinks, diamond electronic components.” Anthony 395 at 7:51–56. “*When* used as free–standing films.” Anthony 395 at 2:55. Emphasis added. “It may be desirable to… finish the diamond parts and then subsequently press.” Anthony 395 at 7:39–41. “As previously discussed, a preferred starting CVD diamond for optical applications typically has crystals with a <110> orientation perpendicular to the bottom surface.” Anthony 395 at 8:10–12.

’189 Claims	Anthony 2005 (US 2005/0260935)
1.[pre] A method to improve the optical clarity of CVD diamond	"The present invention generally relates to the production of gem quality diamonds (colorless and fancy colored diamond) and more particularly to the production of gem quality diamonds from… discolored or so–called "brown" diamonds." Anthony 2005 at [0002].
1.[A] where the CVD diamond is single crystal CVD diamond,	"The present invention is directed to a method for treating… Type IIa diamonds and Type Ia diamonds… to improve their color." Anthony 2005 at [0020].
1.[B] by raising the CVD diamond to a set temperature of at least 1500° C. and a pressure of at least 4.0 GPA outside of the diamond stable phase.	“Annealing conditions depend upon the nature of the defect in the diamond which have to be removed or changed to improve color and can readily be determined by those skilled in the art without undue experimentation.” Anthony 2005 at [0036]. “Pressure conditions for the present invention... [are] in the graphite stable region of the PT diagram, typically in the range from about 10 to about 200 kilobars... Temperatures employed in the practice of the present invention typically are in the range of from about 1500 to about 3500°C.” Anthony 2005 at [0036]. “The diamond stable phase vs the graphite stable phase is generally accepted as being defined by the Simon-Berman line.” Anthony 2005 at [0017]. “A typical annealing run starts with the reaction cell being pressurized to a set pressure of 60kbars…. Thereafter, the temperature is increased to the set value, e.g., approximately 2500C, in 2.5 minutes, and held at the set value for 18 minutes.” Anthony 2005 at [0043]. “A preblocked Type IIa natural polished diamond weighting 3.29 carats and brown in color was placed inside a pill made by pressing high purity Sodium chloride powder. The diamond was annealed at ~60 kbars and ~2500 C. for 6 minutes. Visual examination of the recovered diamond showed that the color had changed to clear or colorless.” Anthony 2005 at [0045].

'189 Claims	**Rapaport (T. Templeman, "NovaDiamond Introduces New Enhancement", Rapaport Diamond Report 23 (2000) 1 and 29–30) at 30.**
1.[pre] A method to improve the optical clarity of CVD diamond	"The [treated] diamonds also display extraordinarily vivid colors, as the color centers are distributed uniformly throughout the diamond. Natural colors tend to be uneven in their color distribution and not as bright." Rapaport at 30.
1.[A] where the CVD diamond is single crystal CVD diamond,	"We find that all diamond types may be color 'activated… We have had our best results using high quality light brown stones.'" Rapaport at 29. "The [treated] diamonds also display extraordinarily vivid colors, as the color centers are distributed uniformly throughout the diamond. Natural colors tend to be uneven in their color distribution and not as bright." Rapaport at 30. "We also feel it is important for scientific purposes to learn what triggers the stone's intense fluorescence to appear at a specific temperature and pressure level." Rapaport at 30.
1.[B] by raising the CVD diamond to a set temperature of at least 1500° C. and a pressure of at least 4.0 GPA outside of the diamond stable phase.	"Each type of stone takes a different pressure and temperature setting in order to achieve similar results… Since each diamond is different in size, clarity, and color, we must first pre-qualify the rought so that we can set the appropriate pressure, temperature, and time." Rapaport at 29. NovaDiamond® Colour Activation Graph (showing "Color Activation Region" below "Diamond/Graphite Stability Line"; the region begins at about 1500C and 42kb; the element line points to a temperature of about 1800C and 48kb). Rapaport at 29. "We also feel it is important for scientific purposes to learn what triggers the stone's intense fluorescence to appear at a specific temperature and pressure level." Rapaport at 30.

'189 Claims	**Strong (US 4,124,690)**
1.[pre] A method to improve the optical clarity of CVD diamond	"The annealed diamond crystals of the present process are also useful as jewelry, especially those of gem quality." Strong at 7:8–9 "Significantly higher [light transmission] than non–annealed." Strong at Table I.
1.[A] where the CVD diamond is single crystal CVD diamond,	"There is disclosed the annealing of type Ib synthetic diamond crystal." Strong at 9:9–10. "The annealed diamond crystals of the present process are also useful as jewelry, especially those of gem quality." Strong at 7:8–9.
1.[B] by raising the CVD diamond to a set temperature of at least 1500° C. and a pressure of at least 4.0 GPA outside of the diamond stable phase.	"Subjecting a specimen consisting of said crystal to an annealing temperature ranging from about 1500°C to about 2000°C… the minimum pressure ranging from 48 kilobars at said annealing temperature of 1500°C to a minimum pressure of 70 kilobars at said annealing temperature of 2200°C." Strong at claim 1. "At 1600°C, the pressure should be at least about 51 kilobars... at 2000°C. the pressure should be at least about 63 kilobars." Strong at 5:17–20.

'189 Claims	**Davies (Graphitization of Diamond at Zero Pressure and at a High Pressure, Proc. R. Soc. Lond. A. 328, 413–472 (1972))**
1.[pre] A method to improve the optical clarity of CVD diamond	"The diamonds available were regular natural octahedra of gem quality with no detectable microcracks or inclusions." Davies at 415.
1.[A] where the CVD diamond is single crystal CVD diamond,	"The diamonds available were regular natural octahedra of gem quality with no detectable microcracks or inclusions." Davies at 415.
1.[B] by raising the CVD diamond to a set temperature of at least 1500° C. and a pressure of at least 4.0 GPA outside of the diamond stable phase.	"Diamonds have also been heated in the temperature range of 1950 to 2200°C under a pressure of 48 ± 3 kbar (4.8 ± 0.3 Gpa)." Davies at 413. See further Davies at 420 (similar); Davies at 424 (similar). "The specimen… was then heated to 1600°C at a rate such that the pressure did not rise above 1 mPa. The temperature was maintained constant at 1600°C… The temperature was then increased quickly to… between 1850 and 2000°C and maintained at that temperature... During this period the pressure never rose above... 3 mPa." Davies at 415–416.

’189 Claims	Burns (WO 01/72406)
1.[pre] A method to improve the optical clarity of CVD diamond	"There is provided a method of changing the colour of a brown type Iia diamond from brown to colourless." Burns at 2.
1.[A] where the CVD diamond is single crystal CVD diamond,	"There is provided a method of changing the colour of a brown type Iia diamond from brown to colourless." Burns at 2. “a brown type IIa diamonds crystal, which will generally be natural diamond” Burns at 3. “This must mean that the scope of Claim 1 of WO 406 is not restricted to natural diamonds. A PSA reading the two claims together would conclude that the method is also claimed for CVD and HPHT diamonds… Accordingly, a PSA following the teachings in Claim 1 of WO 406 on a CVD diamond would inevitably apply the method, and achieve the result, taught in Claim 1 of SG 508... The difference is that Claim 1 of WO 406 refers to Type IIa diamonds (which I have found includes CVD diamonds) while Claim 1 of SG 508 refers specifically to CVD diamonds.” Singapore High Court at 134–135.
1.[B] by raising the CVD diamond to a set temperature of at least 1500° C. and a pressure of at least 4.0 GPA outside of the diamond stable phase.	"Subjecting the reaction mass to a temperature in the range 2200°C to 2600°C under a pressure of 7,6GPa to 9GPa." Burns at 2. “The preferred temperature is in the range 2100C to 2300C, and the preferred pressure is 7,4GPa to 8,5GPa.” Burns at 3.

'189 Claims	**Strong 380 (US 4,174,380)**
1.[pre] A method to improve the optical clarity of CVD diamond	"The large majority of synthesized diamonds are type Ib, but type IIa diamonds can easily be made by excluding nitrogen from the diamond growing media." Strong 380 at 1:21–24.
1.[A] where the CVD diamond is single crystal CVD diamond,	"The large majority of synthesized diamonds are type Ib, but type IIa diamonds can easily be made by excluding nitrogen from the diamond growing media." Strong 380 at 1:21–24.
1.[B] by raising the CVD diamond to a set temperature of at least 1500° C. and a pressure of at least 4.0 GPA outside of the diamond stable phase.	"at 1600 C. the pressure should be at least about 51 kilobars" Strong 380 at 5:25–26.

'189 Claims	**Burns 405 (WO 01/72405)**
1.[pre] A method to improve the optical clarity of CVD diamond	"In the present invention, a grey to brownish grey type IIb diamond crystal, which will generally be natural diamond, is annealed…thereby reducing the brown coloration." Burns 405 at 3.
1.[A] where the CVD diamond is single crystal CVD diamond,	"In the present invention, a grey to brownish grey tybe IIb diamond crystal, which will *generally* be natural diamond, is annealed…thereby reducing the brown coloration." Burns 405 at 3 (emphasis added).
1.[B] by raising the CVD diamond to a set temperature of at least 1500° C. and a pressure of at least 4.0 GPA outside of the diamond stable phase.	"the conditions of step (ii) are 2000C to 2500C under a pressure ranging from 6,7GPa to 9GPa" Burns 405 at 7/claim 3.

'189 Claims	**CN 070 (CN1037070)***
1.[pre] A method to improve the optical clarity of CVD diamond	Inherent *Citations are to the appended translation.
1.[A] where the CVD diamond is single crystal CVD diamond,	"the seed crystals are CVD diamond of appropriate particle number and size grown by chemical vapor deposition method (called CVD method)." CN 070 at 4. "The number and size of the CVD diamond particles generated by the above various CVD methods can be controlled." CN 070 at 5.
1.[B] by raising the CVD diamond to a set temperature of at least 1500° C. and a pressure of at least 4.0 GPA outside of the diamond stable phase.	"Using such suitable number and size of CVD diamond as seed crystals to synthesize high-pressure diamond, a 6 × 600T or 6 × 1000T sixsided top press is still used, but the synthesis pressure can be 4.5 ～ 5.5GPa, preferably 4.6 ～ 4.8GPa , The temperature is 1450 ~ 1550 ° C, the synthesis time can be 3 ~ 10 minutes, preferably 5 ~ 7.5 minutes." CN 070 at 5.
2. The method of claim 1 wherein the CVD diamond is a single crystal coating upon another material.	"Using such suitable number and size of CVD diamond as seed crystals to synthesize high-pressure diamond," CN 070 at 4.

'189 Claims	**Strong 380 (US 4,174,380)**
1.[pre] A method to improve the optical clarity of CVD diamond	"Also, when substantially all or all of the type Ib nitrogen is converted to type Ia nitrogen, the result is a very pale yellow and/or a colorless crystal which has many uses as jewelry, and which frequently is of gem quality." Strong 380 at 6:55–59.
1.[A] where the CVD diamond is single crystal CVD diamond,	"type IIa diamonds can easily be made either by excluding nitrogen from the diamond growing media or by using appropriate nitrogen getters. The large majority of natural diamonds" Strong 380 at 1:21–24. "According to the present process, type Ib synthetic diamond is converted to type Ia." Strong 380 at 2:28–29.
1.[B] by raising the CVD diamond to a set temperature of at least 1500° C. and a pressure of at least 4.0 GPA outside of the diamond stable phase.	"As shown in FIG. 1 by the Region of Conversion, an annealing temperature of about 1500 C. requires a pres sure of at least about 48 kilobars, at 1600 C. the pressure should be at least about 51 kilobars." Strong 380 at 5:23–27. Ex. No. 1A in Table I. Strong 380 at 7:40–50.

’189 Claims	Vagarali (US 2001/0031237)
1.[pre] A method to improve the optical clarity of CVD diamond	“The present invention is directed to a method for treating discolored natural diamond, especially Type IIa diamond… for improving its color.” Vagarali at abs. “A further advantage is the specific ability to make colorless diamonds from Type IIa diamonds.” Vagarali at [0023].
1.[A] where the CVD diamond is single crystal CVD diamond,	“The present invention is directed to a method for treating discolored natural diamond, especially Type IIa diamond… for improving its color.” Vagarali at abs.
1.[B] by raising the CVD diamond to a set temperature of at least 1500° C. and a pressure of at least 4.0 GPA outside of the diamond stable phase.	Next, the pill is placed into a high pressure/high temperature (HP/HT) press at elevated pressure and elevated temperature within the graphite stable range of the carbon phase diagram for a time sufficient to improve the color of said diamond.” Vagarali at abs. “It is central to the present invention that the HP/HT conditions be within the graphite stable range of the carbon phase diagram.” Vagarali at [0033]. “A typical annealing run starts with the reaction cell being pressurized to a Set pressure of ~60 kbars…. Initially, the diamond is heated to approximately 1200° C. and held at this temperature for one minute. Thereafter, the temperature is increased to the set value, e.g., approximately 2500 C., in 2.5 minutes and held at the set value for 18 minutes. The temperature should remain steady at 2500 C during the last 6 minutes.” Vagarali at [0040]. TABLE 1. Stone No. 000511. Vagarali at [0046].

'189 Claims	**Webb (S.W. Webb et al., "Synthetic diamond crystal strength enhancement through annealing at 50kbar and 1500 C", 10 J. Mater. Res., (1995) 7).**
1.[pre] A method to improve the optical clarity of CVD diamond	"Annealing appears to have possibly reduced the high-energy surface site size and/or reduced the gross number of internal dislocations." Webb at 1706.
1.[A] where the CVD diamond is single crystal CVD diamond,	"Diamond samples were all synthetic, single-crystal, saw-grade products, with cubo-octahedral shapes in the 40/50 mesh (425-300 /xm) range." Webb at 1702.
1.[B] by raising the CVD diamond to a set temperature of at least 1500° C. and a pressure of at least 4.0 GPA outside of the diamond stable phase.	"The annealing experiments were done in a HPHT cell at approximately 55 kbar pressure and temperatures ranging 1200-1800 °C in a belt-type apparatus." Webb at 1702. "Synthetic diamond crystal strength enhancement through annealing at 50kbar and 1500 C." Webb at 1700. "Magnetic susceptibility of synthetic crystals before and after HPHT anneal at 1500 °C, 30 min, and 50 kbar." Webb at 1704.